Space Weather Forecast

Issued on Saturday, 06 January 2024 at 13:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of Moderate activity with a slight chance of Strong activity. CME (Coronal Mass Ejection) arrival forecast on late 07 or 08 January.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low with only Common-class flaring observed. The main source of these flares has been a complex region close to the centre disc. A region in the southwest has also produced significant Common-class flares along with a region close to the southeast limb. A further moderately complex region in the northwest has been relatively inactive. These are four of eleven regions on the visible disc, with the remaining regions relatively inactive. One potential Earth-directed CME has been analysed in the past 24 hours, from the region in the northeast quadrant. A further CME likely occurred on the morning of 06 January from the aforementioned complex area near centre disc, but further imagery will be required to conduct an analysis.

Solar Wind / Geomagnetic: Solar winds are currently likely to be at slightly elevated levels, but there is some uncertainty regarding this due to suspect data and solar winds may actually be lower. Total magnetic field strength was weak, with the north-south component also varying weakly. Geomagnetic activity has been Quiet throughout.

Energetic Particles / Solar Radiation: Count rate of energetic particles (high energy protons) have been at background throughout, on a declining trend.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast, with a slight chance of Strong activity.

Solar Wind / Geomagnetic Activity: A CME which left the Sun from the northeast quadrant late on 04 January may glance the Earth either late on 07 or during 08 January. Solar wind speeds are expected to decline to background, with a fast solar wind forecast to connect with the Earth either late on 07 or during 08 January, perhaps reaching elevated levels. Geomagnetic activity is forecast to start Quiet. Unsettled to active intervals are then possible on 08 or 09 January, with a slight chance of G1/Minor Storm intervals due either to the fast solar wind, CME or a combination of both.

Energetic Particles / Solar Radiation: GOES16 high energy proton flux is below the S1/Minor Storm threshold. This is expected to follow a declining trend, but with a risk of further increases above the threshold on 08 or 09 January due to the CME arrival.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	15	15	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	30	30
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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